

ABSTRACT

According to the present invention, there is provided a method for surface processing by plasma polymerization of a surface of a metal by using a DC discharge plasma, comprising the steps of: positioning an anode electrode which is substantially of metal to be surface-processed and a cathode electrode in a chamber; maintaining a pressure in the chamber at a predetermined vacuum level; blowing an unsaturated aliphatic hydrocarbon monomer gas or a fluorine-containing monomer gas at a predetermined pressure and a non-polymerizable gas at a predetermined pressure into the chamber; and applying a voltage to the electrodes in order to obtain a DC discharge, whereby to obtain a plasma consisting of positive and negative ions and radicals generated from the unsaturated aliphatic hydrocarbon monomer gas or the fluorine containing monomer gas and the non-polymerizable gas, and then forming a polymer with hydrophilicity or hydrophobicity on the surface of the anode electrode by plasma deposition, and also provided a method for surface processing by plasma polymerization of a surface of a materials including a metal, a ceramic or a polymer by using an RF discharge plasma, comprising the steps of: positioning a passive electrode which is of the material to be surface-processed and an active electrode which is substantially of metal in a chamber; maintaining a pressure in the chamber at a predetermined vacuum level; blowing an unsaturated aliphatic hydrocarbon monomer gas or a fluorine-containing monomer gas at a predetermined pressure and a non-polymerizable gas at a predetermined pressure into the chamber; and applying a voltage to the electrodes in order to obtain an RF discharge, whereby to obtain a plasma consisting of positive and negative ions and radicals generated from the unsaturated aliphatic hydrocarbon monomer gas or the fluorine containing monomer gas and the non-polymerizable gas, and then forming a polymer with hydrophilicity or hydrophobicity on the surface of the passive electrode by plasma deposition.